

Activity 1

Waste: Where Does It Come From? Where Does It Go?



Duration	2 class periods
Grade Level	9-12
Key Terms/ Concepts	Hazardous waste
Suggested Subjects	Biology Chemistry Health Life Science Physical Science Social Studies

Purpose

In this lesson, students use a map to identify and locate potential sources of hazardous waste in their neighborhood or community. In the process, students learn what hazardous waste is and identify the potential threats it poses. Students learn that while most hazardous waste is the result of manufacturing processes, many common household products also become hazardous waste when thrown away.

Background

Our lifestyles are supported by complex industrial activities that produce vast quantities of waste. Industries that produce our clothing, cars, paper, medicines, plastics, electronic components, fertilizers, pesticides, and cosmetics—to name only a few—use and discard thousands of hazardous chemicals and other substances every year.

Add to that the thousands of tons of medical wastes—blood, syringes, and used bandages—thrown out by hospitals. Add to that millions of scrapped cars, buses and trucks. And to that add more than 195 million tons of garbage Americans discard every year. Household garbage contains not only eggshells and potato peelings but also hazardous substances like those in household cleaning products, used oil, and spent batteries. The result is a **hazardous waste** crisis. And the problem continues to grow.

People can help solve the hazardous waste problem and protect their own community. But in order to have an impact on the problem, people must first learn to identify the sources of hazardous waste in the community. With this knowledge, citizens can develop strategies to reduce the amount of hazardous waste produced and protect their community, their families, and themselves.



To help prepare your students for this activity, use *Warm-Up 1: Defining Hazardous Waste*. You can use the entire Warm-Up or simply review the main points covered. For additional introductory information on hazardous substances and hazardous waste, see the Suggested Reading list found at the end of the Haz-Ed materials.

Preparation

1. Assemble the following materials:
 - Map of the community, as detailed as possible (call the local Chamber of Commerce or town hall)
 - Red, green, and blue markers
 - Copies for each student of *Fact Flash 1: Hazardous Substances and Hazardous Waste*.
2. Read Fact Flash 1 to prepare for your lecture.
3. Distribute Fact Flash 1 and have students read it for homework.

Procedure

Class #1

1. Summarize information found in Fact Flash 1 and your research in preparing the class, including how hazardous waste sites are created from a variety of sources. Explain that in this class, students will identify potential sources of hazardous waste.
2. Place the map on an easel or hang it on a wall where students can see it. (*NOTE: If you live in a large city, it may be more appropriate to use a map of the school district or neighborhood in which the school is located rather than of the whole city.*)
3. Have students point out and **circle in green** significant landmarks such as the school, major factories, and shopping malls.
4. Review *Fact Flash 1: Hazardous Substances and Hazardous Waste* that students read for homework. Define terms and answer questions as needed.



5. Ask students to name some products they or their parents use at home that could produce hazardous waste. Students can use information from Fact Flash 1 to identify these products. *(NOTE: You may want to have one student record answers on the chalkboard.)* How do the students and their families dispose of these products after they are used? Do they participate in a recycling program? Is there a hazardous household chemicals disposal program in the community? Do their families participate? Do they know where the garbage from their house goes when it is picked up? **If so, have the students mark the landfill or other facility on the map in blue.**
6. Ask students to name other possible sources of hazardous waste in the community. *(NOTE: If necessary, prompt this discussion. Possible answers include not only large factories and petroleum refineries, but also gasoline stations, auto repair/paint and body shops, dry cleaners, hospitals, nursing homes, dental offices, medical laboratories and testing facilities, funeral homes, nurseries, garden supply stores, farms, poultry breeding and processing companies, major building construction sites, fast-food restaurants, and junkyards.)* **Have the students mark each of these sites on the map in red.**
7. Encourage students to suggest where waste from these facilities might go when it is picked up. *(Answers could include sanitary landfills, incinerators, recycling centers, and, in some communities, waste-to-energy plants.)* **Have the students mark these on the map in blue.**
8. Divide the class into 3 teams.
 - Assign one team the responsibility of gathering information outside class to help refine the map by identifying and marking other hazardous waste sources.
 - Assign the second team the responsibility of contacting the local health or environmental services department to investigate how much residential garbage is collected and disposed of each year and what the local government is doing to deal with the potential hazardous waste problems this creates (for example, how are paint thinners and pesticides handled?).
 - Assign the third team to do similar research about the amount and the handling of the community's industrial waste.
9. Explain that each team is to make a short presentation (5 to 10 minutes) on the results of their research during a follow-up class (specify the date). Allow each team to select a spokesperson to make the team's presentation and to organize itself and assign specific tasks in order to complete the project.



Class #2

1. Have each group present its research findings to the class. Encourage students to ask questions and to discuss how they, as individuals and as a class, might influence the local government's efforts to reduce the hazardous waste problem. Have a student record the ideas on the chalkboard.
2. Ask for suggestions on how to take action on any of the ideas offered. Whom would students want to approach with their ideas? What would be the best, most effective way to present their ideas? *(NOTE: The point here is to elicit some ideas for presentation formats. The list might include writing a report on their research and making recommendations, writing an article for the school or community newspaper, designing a display and putting it in the school lobby or taking it to a local shopping mall, or making a presentation at a school assembly or at a PTA meeting.)*

Extension (Optional)

- Allow the class to choose specific ideas they want to pursue and design a plan of action. Monitor and facilitate their progress until completion.